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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Guy Zanella

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EXAMINER

AFTERGUT, JEFF H

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/519,949	Applicant(s) ZANELLA ET AL.	
	Examiner Jeff H. Aftergut	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16, 18-22 and 31-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16, 18-22 and 31-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 38, 43, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent 1985159 in view of Saint Gobain (the internet publication dated July 30, 2001 from the website <http://www.twitex.com/fabrication-processes/tw-process.html>, hereinafter referred to as Saint Gobain).

German Patent '159 suggested that those skilled in the art at the time the invention was made would have formed a hybrid fiber yarn material from 50% polypropylene and 50% natural fiber to form a hybrid spun yarn. The reference taught that the hybrid yarn was fed into an extrusion device wherein it was subjected to heat within the extrusion nozzle 6 which included as part of an extrusion device which supplied molten plastic to the commingled filaments from extruder 2. the reference taught that additional extruded plastic material was added to the melted commingled filaments and that the assembly was fed through a shaping nozzle 6. after being further provided with the thermoplastic material, the commingled and heated filaments were subjected to a winding operation wherein the so formed band was wound upon a mandrel 4. the applicant is referred to the machine translation and in particular the discussion found regarding to Example 1 on page 2 of the translation. The German Patent '159 failed to teach that those skilled in the art would have employed a glass fiber as the reinforcing fiber in the processing described therein. Additionally, while the extrusion nozzle clearly preheated the commingled yarn therein, it was not expressly

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taught to preheat the material separate of the extrusion nozzle prior to introduction of the matrix which formed the exterior sheath about the material.

The applicant is advised that those skilled in the art at the time the invention was made would have known to incorporate a hybrid blend of glass and polypropylene fiber material in the manufacture of the wound assembly wherein in the extrusion operation one preheated the hybrid commingled material prior to entrance into the die as suggested by Saint Gobain. The reference to Saint Gobain taught that those skilled in the art would have employed this extrusion operation with the commingled yarn in order to provide a function (color or texture) to the reinforcement as well as increase the stiffness as reduce thermal expansion of the commingled fiber material. The reference taught that the commingled material was heated with IR heating means prior to being received by the co extrusion device which included an exit nozzle therein. the reference did not teach that those skilled in the art would have filament wound this product, however German Patent '159 suggested filament winding subsequent to the extrusion operation and German Patent '159 suggested that glass would have been a useful reinforcing material in the operation therein. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the techniques of Saint Gobain in the process of German Patent '159 in order to filament wind with a glass reinforcing fiber and polypropylene blend.

Saint Gobain suggested a strip formed from glass and polypropylene filaments which are commingled together. Note regarding claim 43 that the reference to Saint Gobain suggested that the thermoplastic introduced in the extruder was for surface

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finish and or texture to the finished strip. Clearly, such properties would have been conferred to the wound product as German Patent '159 suggested the winding of the strip of material. With respect to claim 44, the number of strips introduced and the number of dies employed was a function of the amount of reinforcement in the finished composite strip as well as the amount of thermoplastic matrix present (as well as whether or not one introduced multiple types of thermoplastic materials) and the use of plural dies and plural first composite strips was well known and conventional in the art.

3. Claims 16, 18-22, 31, 32 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 2 further taken with Smith (newly cited).

The references as set forth above suggested that the thermoplastic would have been introduced into the extrusion die to provide matrix for the reinforcement in the operation of German Patent '159, however there is no indication in the reference that one would have introduced the material in an off center manner such that there was a layer of resin matrix (resin rich) region in the finished assembly. However, introduction of resin in a die where the resin was introduced under pressure into the die such that a resin rich surface coating was provided with the resin introduced in the die was known in composite article manufacture as evidenced by Smith. Smith suggested that surface deficiencies may exist in glass reinforced plastic articles and that such deficiencies were resolved by application of a gel coat to the fiber reinforced plastic materials, column 1, lines 30-50. in order to provide a superior surface finish to the composite material, it was known to introduce the resin such that a resin rich surface was formed on the surface

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and the matrix material introduced in the die was off center as defined in the claims and as suggested by Smith. in order to provide one with the ability to achieve a superior finish to the end product with a reduction in the amount of exposed glass fibers on the surface it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the resin material in the die wherein the reinforcement was off center in order to provide a desired surface finish to the material as suggested by Smith in the process of making a composite strip and winding the same as taught above in paragraph 2.

Regarding claim 18, while the references do not express a void volume of the strip, one skilled in the art would have desired to reduce the amount of void in the strip to a minimal amount in order to achieve a finished product with a minimal amount of voids. regarding claim 19, the reference to Saint Gobain clearly suggested that those skilled in the art would have preheated the assembly in order to facilitate suitable impregnation with the additional molten plastic material in the extruder. with respect to claim 20, note that German patent '159 as well as Saint Gobain suggested that one skilled in the art would have provided for heating above the melting point of the strip material and additionally recognize that one skilled in the art of filament winding would have understood that the material would have been heated at the point of lay down as suggested by Saint Gobain. Regarding claim 21, note that the references suggested a 50-50 blend of the reinforcement and matrix fibers in the assembly. regarding claim 22, note both references suggested that the material would have been subjected to an extruder die at the exit of the extruder in order to shape the tape prior to filament

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winding the same. Regarding claims 31 and 32, note that the reference to German Patent '159 suggested the direct winding of the strip upon the mandrel without additional heat and pressure added thereto and thus it is not seen that additional heat and pressure were necessary in the winding operation therein. regarding claim 40, note that the reference to Smith clearly envisioned the off center coating and/or impregnation of the strip to provide a resin rich surface. Regarding claim 41, see the discussions above regarding claim 18. regarding claim 42, note that the thickness of the finished wound body from one end to the other was a function of the winding operation, i.e. by winding more material at one end of the mandrel one would have achieved a thicker end at one part of the shaft. Such winding techniques are well known and conventional in the art as a function of the desired finished assembly one wished to attain and use of such a winding process would have been within the purview of the ordinary artisan.

4. Claims 33-37 and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 2 further taken with PCT WO 00/47397 for the same reasons as expressed in paragraph 6 of the office action dated December 3, 2008.

With respect to the amendment to claim 33, note that the reference to German Patent '159 desired a constant amount of reinforcement therein. The reference to PCT '397 suggested that in some instances it was desirable to vary the strength of the pultruded component along it's length. To do the same one skilled in the art would have varied the cross sectional shape of the product by varying the cross sectional shape of the die (this is one way envisioned by PCT '397 to achieve varied strength along the

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length of the product). In order to avoid resin rich or resin starved areas while changing the cross sectional shape at the exit of the die, one must increase the amount of resin fed to the die during pultrusion. Note that varying Resin percentage content in the cross section along the length while maintaining the amount of reinforcement constant would have resulted in varied product strength along the length of the material exiting the die. As German Patent '157 suggested that subsequent to exiting the die the material was wound on a mandrel, such processing with a variable cross section die would have resulted in variable weight percent of resin along the length of the wound product. Because it would have been desirable to produce a composite which had varied strength along its length by inclusion of additional resin within the product along the cross section of the length of the same, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the techniques of PCT WO 00/47397 in the process as set forth above in paragraph 2 to vary the amount of reinforcement and the final strength in the finished composite assembly.

Response to Arguments

5. Applicant's arguments with respect to claims 16, 18-22 and 31-44 have been considered but are moot in view of the new ground(s) of rejection.

With respect to PCT '397, the applicant argues that while the reference did suggest that those skilled in the art knew how to vary the cross sectional shape of the material during pultrusion it required a complex and complicated die arrangement and such would have led one away from processing the material in this fashion. This is not well taken. Essentially, applicant has admitted that the reference taught changing the

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cross sectional shape by varying the amount of thermoplastic introduced into the die, but that the reference taught away from doing the same because it was complicated and complex operations. The applicant is advised that their own disclosure gives no guidance as to the apparatus employed to vary the amount of thermoplastic introduced into the die to vary the amount of reinforcement along the length of the finished product. As such, it is assumed that applicant's have found that it was in fact not so complex or complicated to vary the cross sectional shape of the die at the exit to account for the increased amount of resin fed through the die to achieve the variations claimed. Clearly, because applicant is doing nothing more than what was suggested in the prior art (at least there is nothing special disclosed as it relates to the specific die arrangement which enabled one to vary the amount of thermoplastic introduced into the extruder) it is deemed that one skilled in the art would have known how to vary the cross section of the die at the exit of the die to achieve and/or accommodate the increase in resin fed to the die. Note that the reference to UK 2041489 suggested the variation in the cross section of the exit die during pultrusion.

The additional references have been added to address the new limitations added to the claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Boggs taught an off center reinforcement and reasons why one skilled in the art would desire a resin rich layer on the surface of the finished composite assembly.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Jeff H. Aftergut/ whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:30-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff H. Aftergut/
Primary Examiner
Art Unit 1791

JHA
May 11, 2009